DETAILED ACTION

Election/Restrictions

1. Upon further consideration, the election of restriction requirement mailed on April 3, 2008 is hereby withdrawn since the process is not specially adapted for the manufacture of the product.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 16, 17, 19, 22, 23, 26 – 28, 30 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Reichenbach et al. (U. S. Pub. No. 2004/0,065,932).

Regarding claim 16, Reichenbach et al. discloses in e.g., Fig. 12 microcomponent (the micro component in e.g., Fig. 12) comprising a hermetically-sealed microcavity (26; page 3, paragraph 0043, lines 3 and 4), delineated by a cover (16; page 3, paragraph 0039, lines 5 – 7) in which at least one hole (24; page 3, paragraph 0042, line 2 and see e.g., Fig. 5) is formed, and, on the cover (16), a sealing layer (34; page 4, paragraph 0049, line 3) hermetically sealing the microcavity (28; page 4, paragraph 0049, lines 1 – 3), the microcomponent comprising, under the sealing layer (34), a plug (32; page 4, paragraph

0046, lines 1 – 3) covering the hole (24) and a part of the cover (16) over the periphery of the hole (24; see e.g., Fig. 12), the sealing layer (34) and the plug (32) being formed by distinct materials (page 4, paragraph 0046, lines 1 – 2 and page 4, paragraph 0049, lines 3 – 5), wherein the plug (32) is made of a material that is able to undergo creep deformation (the plug 32 of Reichenbach et al. is made by polysilicon. It is known in the art that the polysilicon material is able to undergo creep deformation at some range of temperatures. Thus, the plug 32 of Reichenbach et al. fully anticipates this limitation).

Regarding claim 17, Reichenbach et al. discloses in e.g., Fig. 12 the material that is able to undergo creep deformation (polysilicon) being a polymerized material (page 4, paragraph 0046, lines 1 – 2).

Regarding claim 19, Reichenbach et al. discloses in e.g., Fig. 12 the material that is able to undergo creep deformation being a glass (since polysilicon is known as a glass material, hence the plug 32 of Reichenbach et al. fully anticipates this limitation).

Regarding claim 22, Reichenbach et al. discloses in e.g., Fig. 12 the hole (24) being arranged on the highest part of the microcavity (26; see e.g., Fig. 12).

Regarding claim 23, Reichenbach et al. discloses in e.g., Fig. 12 a plurality of holes (see e.g., Fig. 12).

Regarding claim 26, Reichenbach et al. discloses in e.g., Fig. 12 the plug (32) being non-hermetical (page 4, paragraph 0048, lines 1 – 14).

Regarding claim 27, Reichenbach et al. discloses in e.g., Fig. 12 the material of the sealing layer (34) being selected from silicon dioxide, silicon nitride (page 4, paragraph 0049, lines 3 – 5) and metals.

Regarding claim 28, Reichenbach et al. discloses in e.g., Figs. 1 – 12 method for production of a hermetically-sealed microcavity of a microcomponent according to claim 16, successively comprising

- deposition of a sacrificial layer (the sacrificial layer; page 3, paragraph 0043, line 1) on a substrate (10; page 3, paragraph 0039, line 1),
- deposition of a first layer (16) forming the cover, on the substrate (10) and sacrificial layer (the sacrificial layer),
- etching, in the cover, of at least one hole (24) opening out onto the sacrificial layer (the sacrificial layer; page 3, paragraphs 0041 – 0043),
- removal of the sacrificial layer (the sacrificial layer; page 3, paragraph 0043), via the hole (24), so as to create the microcavity (26; see e.g., fig. 5),
- deposition of the sealing layer (34; see e.g., Fig. 11), so as to seal the microcavity hermetically (26), method comprising deposition of the plug (32) covering the hole (24) and a part of the cover over the periphery of the hole (24; see e.g., Fig. 10), after the sacrificial layer (the sacrificial layer) has been removed (Fig. 5) and before the sealing layer (34) is deposited (see e.g., Fig. 11).

Regarding claim 30, Reichenbach et al. discloses in e.g., Figs. 1 – 12 the plug (32) being made of a porous material (page 4, paragraph 0048 and page 6, paragraph 0063, lines 1 – 8).

Regarding claim 32, Reichenbach et al. discloses in e.g., Figs. 1 – 12 the method comprising a pumping step of the gas contained in the microcavity (26), through the

porous material (32), before the sealing layer (34) is deposited (page 4, paragraphs 0047 and 0049).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 18, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reichenbach et al.

Regarding claim 18 and 20, Reichenbach et al. discloses the claimed invention except for the polymerized material being selected from photoresists and polyimide (claim 18) and the glass being selected from phosphosilicate glasses (claim 20). It would have been obvious to one having ordinary skill in the art at the time when the invention was made to use the photoresists or polyimide as the specific material for the polymerized material and the phosphosilicate glasses as the specific material for the glass, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

6. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reichenbach et al. in view of Murari et al. (U. S. Pat. No. 6,779,247).

Regarding claims 24 and 25, while Reichenbach et al. discloses the use of the plug, Reichenbach et al. does not disclose the thickness (claim 24) and shape (claim 25) of the plug. Murari et al. teaches in e.g., Fig. 15 the thickness of a plug (40; column 5, lines 32 – 33) being comprised between 2 and 6 micrometers (column 5, lines 34 – 36) and the plug (40) comprising sloping sides (column 5, lines 34 – 37 and see e.g., Fig. 15). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply the thickness and the shape of Murari et al. as the specific thickness and the shape to form the plug of Reichenbach et al. as taught by Murari et al. to seal the top of the cavities and to prevent penetrate the cavities (column 5, lines 39 – 42).

Allowable Subject Matter

7. Claims 29 and 31 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(A) Claim 29 contains allowable subject matter because none of references of record teach or suggest, either singularly or in combination, at least the limitation of a plug being made of phosphosilicate glass, and the plug being obtained by a method selected from solgel methods and cathode sputtering.

(B) Claim 31 contains allowable subject matter because none of references of record teach or suggest, either singularly or in combination, at least the

limitation of a porous material being a photoresist, and the method comprising a high temperature annealing step.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ouellet, Partridge et al., Lin et al. and Hynes et al. disclose a semiconductor device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRIS C. CHU whose telephone number is (571)272-1724. The examiner can normally be reached on 11:30 - 8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call

800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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